

# **IOWA HIGHWAY RESEARCH BOARD (IHRB)**

*Minutes of June 29, 2012*

## **Regular Board Members Present**

A. Abu-Hawash  
J. Berger  
R. Knoche  
J. Moellering  
E. Steffensmeier

J. May  
W. Weiss  
K. Mayberry  
C. Schloz

## **Alternate Board Members Present**

T. Simodynes for B. Younie  
D. Little for V. Dumdei  
D. Miller for J. D. King  
W. Klaiber for T. Wipf

## **Members with No Representation**

D. Schnobelen  
R. Kieffer

## **Secretary - M. Dunn**

## **Visitors**

Sandra Larson  
Vanessa Goetz  
Lori Pflughaupt  
Linda Narigon  
Mike Nop  
Jeremy Vortherms  
Brent Phares  
Shauna Hallmark  
Chris Cromwell

Iowa Department of Transportation  
Iowa Department of Transportation  
Iowa Department of Transportation  
Iowa Department of Transportation  
Iowa Department of Transportation  
Iowa Department of Transportation  
Iowa State University/InTrans  
Iowa State University/InTrans  
FHWA Iowa Division

The meeting was held at the Iowa Department of Transportation Ames Complex, Materials East/West Conference Room, on Friday, June 29, 2012. The meeting was called to order at 9:00 a.m. by Chairperson Ron Knoche with an initial number of 11 voting members/alternates at the table.

## **Agenda**

No changes were made to the Agenda.

**Motion to approve Minutes from the June 1, 2012 meeting** by J. Berger. 2<sup>nd</sup> by W. Weiss.  
Motion carried with 11 Aye, 0 Nay, 0 Abstaining.

**\*\*\*Two additional members were added for a total of 13 voting members\*\*\***

**FINAL REPORT TR-579, Low Cost Strategies to Reduce Speed and Crashes on Curves,**  
Shauna Hallmark, Iowa State University/InTrans (\$80,000)

**BACKGROUND**

Lane departure crashes are a significant safety concern. The majority of lane departure crashes occur in rural areas, and mostly on two-lane roadways. A disproportionate number of these crashes occur on horizontal curves. Curve-related crashes involve a number of roadway and driver causative factors.

The frequency and severity of curve-related crashes is correlated to a number of geometric factors such as curve radius, degree of curve, length of curve, type of curve transition, lane and shoulder width, and preceding tangent length.

The primary driver factor is speeding, given a large number of run-off-road fatal crashes on curves are speed related. The amount of speed reduction from the tangent speed to the speed required to traverse a curve also has an impact on the frequency and severity of crashes on curves.

Dynamic speed feedback sign (DSFS) systems are one method to reduce vehicle speeds and, consequently, crashes on curves. DSFS systems show promise, but they have not been fully evaluated.



**OBJECTIVES**

The objective of this project was to evaluate low-cost measures to reduce speeds on high-crash horizontal curves. The researchers evaluated two low-cost treatments in Iowa to determine their effectiveness in reducing speeds on rural two-lane roadways. This report summarizes how the research team selected sites and collected data, and the results. The team selected six sites. Retro-reflective post treatments were added to existing chevrons at four sites and on-pavement curve markings were added at two sites. The researchers collected speed data before and after installation of the two treatments. The study compared several speed metrics to assess the effectiveness of the treatments. Overall, both were moderately effective in reducing speeds. The most significant impact of the treatments was in reducing the percentage

of vehicles traveling over the posted or advisory speed by 5, 10, 15, or 20 or more mph. This result suggests that the treatments are most effective in reducing high-end speeds.

## DISCUSSION

Q: Was the on-pavement advisory the only signage (did you remove existing signage) or use on-pavement signage a supplement to existing signage?

A: We did not remove any existing signage and do not recommend that. We used all treatments as additional signage.

Q: Was the painting you did on the road right next to the curve sign?

A: It was placed just before the Point of Curvature (PC), between curve advisory sign and PC, so after the advisory sign we placed the on pavement signage. There is a problem with the wearing of the paint on the pavement.

Q: What was the cost for the signs?

A: Advisory signs were \$5,000-\$7,500.

**Motion to Approve** by W. Weiss. 2<sup>nd</sup> by K. Mayberry.

Motion carried with 13 Aye, 0 Nay, 0 Abstaining.

## IMPLEMENTATION DISCUSSION TR-579

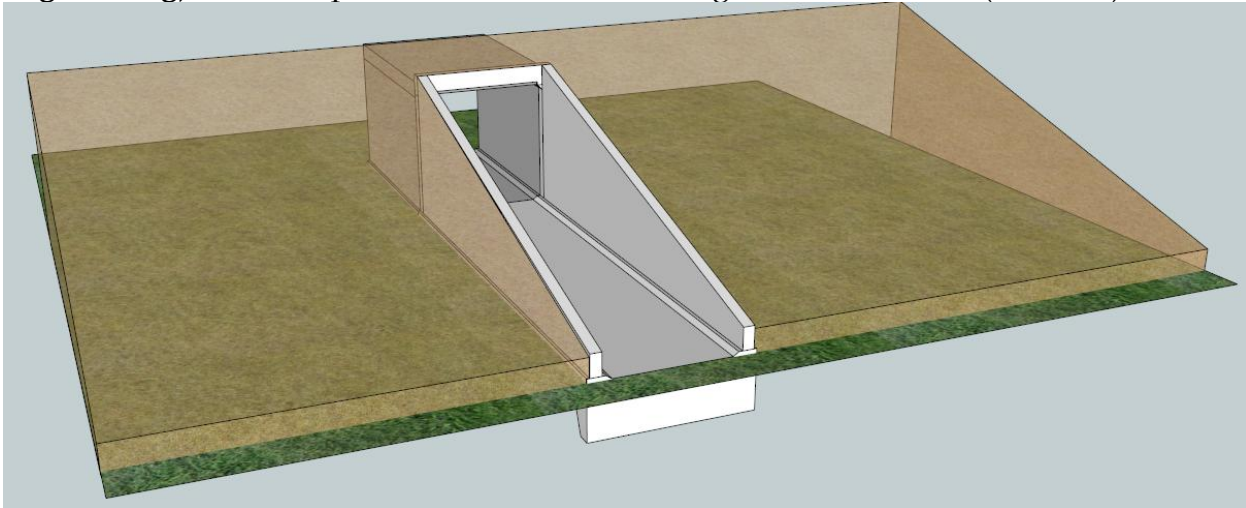
\*Mills County is interested in locating and purchasing the material used to add to visibility of existing signs and curves. There are some curves in Mills County with a lot of crashes. Greene County is also interested in adding visibility to many of their rural road curves.

\*W. Weiss will add this item to the agenda for the December County Engineers conference and provide the final report and toolbox manual to attendees at meeting. Iowa DOT will print the copies

\*The tool-box document is a valuable implementation tool for the counties.

\*There are vandalism concerns with the dynamic signs.

**FINAL REPORT TR-618, Parallel Wing Headwalls for Single RCBs (LRFD) (Shuck-Britson Engineering),** Mike Nop, Iowa DOT Office of Bridges and Structures (\$130,248)  
**FINAL REPORT TR-620, Update of RCB Culvert Standards to LRFD Specifications (Foth Engineering),** Mike Nop, Iowa DOT Office of Bridges and Structures (\$339,471)



Standards Available: <http://www.iowadot.gov/bridge/v8elrfdculstd.html>

CulvertCalc Software Available: <http://www.iowadot.gov/bridge/finalprog.htm>

## OBJECTIVES

- Develop LRFD English standards for parallel wing headwalls (PWHs) for single RCB culverts. PWH details were developed for skews of 0, 15, 30, and 45 degrees except 3x3 and 4x4 culverts have details for a 0 degree skew only.
- PWH details developed to accommodate the following single RCB sizes (span x height in feet):  
3x3, 4x4, 5x3, 5x4, 5x5, 5x6, 6x3, 6x4, 6x5, 6x6, 6x7, 6x8, 8x4, 8x5, 8x6, 8x7, 8x8, 8x9, 8x10, 10x4, 10x5, 10x6, 10x7, 10x8, 10x9, 10x10, 10x11, 10x12, 12x4, 12x5, 12x6, 12x7, 12x8, 12x9, 12x10, 12x11, 12x12
- Update English reinforced cast-in-place concrete box culvert standards to LRFD.
- Develop software to design single, twin, and triple box culvert barrel sections for LRFD: CulvertCalc IA.
- Design and detail single box sizes (span x height in feet) for fill heights from 0' to 55':  
3x3, 4x4, 5x3, 5x4, 5x5, 5x6, 6x3, 6x4, 6x5, 6x6, 6x7, 6x8, 8x4, 8x5, 8x6, 8x7, 8x8, 8x9, 8x10, 10x4, 10x5, 10x6, 10x7, 10x8, 10x9, 10x10, 10x11, 10x12, 12x4, 12x5, 12x6, 12x7, 12x8, 12x9, 12x10, 12x11, 12x12
- Design and detail twin box sizes (span x height in feet) for fill heights from 0' to 25':  
8x4, 8x5, 8x6, 8x7, 8x8, 8x9, 8x10, 10x4, 10x5, 10x6, 10x7, 10x8, 10x9, 10x10, 10x11, 10x12, 12x4, 12x5, 12x6, 12x7, 12x8, 12x9, 12x10, 12x11, 12x12
- Design and detail triple culvert box sizes (span x height in feet) for fill heights from 0' to 25': 10x4, 10x5, 10x6, 10x7, 10x8, 10x9, 10x10, 10x11, 10x12, 12x4, 12x5, 12x6, 12x7, 12x8, 12x9, 12x10, 12x11, 12x12

- Design and detail flared wing headwalls for LRFD for twin and triple boxes.
- Design and detail standard flume and flume basins for LRFD.
- Detail all necessary sheet changes for bell joints, culvert extensions, baffles, and weirs.
- TR-620 Phase 2: Add load and resistance factor rating (LRFR) to CulvertCalc IA software to accommodate new designs and existing culverts.
- SPR-CULVHL: "Determination of Entrance Loss Coefficients for Twin Pre-Cast and Triple RCB Culvert Designs", Marion Muste, Univ. of Iowa, Completed by December 2012
- Precast box culverts (Outside services funding)
  - ASTM C1577-11a (LRFD) replaces ASTM C1433 in IDOT SS 2415.01.B.2.
  - BoxCar Version 3.1 or later (LRFD)
  - IDOT LRFD precast box standards based on MnDOT standards by August 31, 2012 for release in October.

## **DISCUSSION**

- It would be beneficial if the "old" standards are archived, not just replaced.
- Bridge office could work with Local Systems to send out an update to users to inform them that there is a new update available to use.
- Bridge would like some feedback regarding the website.

**Motion to Approve TR-618** by K. Moellering. 2<sup>nd</sup> by E. Steffensmeier.

Motion carried with 13 Aye, 0 Nay, 0 Abstaining.

**Motion to Approve TR-620** by A. Abu-Hawash. 2<sup>nd</sup> by E. Steffensmeier.

Motion carried with 13 Aye, 0 Nay, 0 Abstaining.

## **RFP-12-04 Adapting Accelerated Bridge Construction (ABC) Best Practices for Small-Scale Projects with Local Jurisdictions**

### **RFP Standards for 40'-0 to 70'-0 span Non-pre-stressed, Precast Bridges with High Abutments**

## **DISCUSSION**

- The Bridge Office would like feedback from counties before doing a lot of design that they can't use.
- Designing standards has been delayed in effort to avoid duplication of designs or needs.
- At the last County Engineers meeting, 4 county engineers volunteered to meet with Bridge Design and decided to focus on 30, 40 & 50 foot span pre-cast slab concept along with precast abutments to go with it. Longer spans discussed were on-site post tensioned 60 & 70 foot spans.
- For spans greater than 50 feet, you really need to go pre-stressed or post-tensioned.

- The Bridge Office will proceed with development of the design for one length of bridge and bring it back for review before completing the other lengths. Once the first design is complete, the other lengths will be completed, either by the Bridge office or consultant. If it is determined that they need a consultant to complete the standards, there will be a funding request to the Board. There will not be a funding need at this time.

## ***NEW BUSINESS***

The IHRB will be sponsoring a Board visit to the SSAB Steel Day Event, September 26, 2012 at the mini-mill near Muscatine, Iowa. This trip will include presentations on their processes and a tour of the facility. A notice will be sent to IHRB with details of the event. All members and alternates who plan to attend should let Mark Dunn know so a list of attendees can be submitted. This will not be a travelling meeting. The regularly scheduled IHRB meeting will be held September 28, 2012 in Ames.

## ***ADJOURN***

Motion to Adjourn by J. Berger. 2<sup>nd</sup> by Miller.

Motion carried with 13 aye, 0 nay, 0 abstaining.

**The next meeting of the Iowa Highway Research Board will be held Friday, September 28, 2012, in the East/West Materials Conference Room at the Iowa DOT. The meeting will begin promptly at 9 a.m.**



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Mark J. Dunn, IHRB Secretary